THE following additions have been made to the Brighton Aquarium during the past week:—Two Puffins (*Fratercula arctica*); small Crocodile (*Crocodilus sp.*) from Sumatra, presented by Captain Murray; Bass (*Labrax lupus*); Black Bream (*Cantharus lineatus*); Streaked Gurnards (*Trigla lineata*); Mackerel (*Scomber scomber*); Lumpfish (*Cyclopterus lumpus*); Grey Mullet (*Mugil capito*); Ballan Wrasse (*Labrus maculatus*); Flounders (*Pleuronectes flesus*), fresh-water variety, presented by F. J. Evans, Esq.; Herring (*Clupea harengus*); Conger Eels (*Conger vulgaris*); John Dorée (*Zeus faber*); Sea Horses (*Hippocampus ramulosus*) from the Mediterranean; Octopus (*Octopus vulgaris*); Oysters (*Ostrea edulis*); Zoophytes (*Actinoloba dianthus*), (*Sagartia nivea*), (*S. miniata*), (*Alcyonium digitatum*), (*Tubularia indivisa*).

THE additions to the Zoological Society's Gardens during the past week include a Dormouse Phalanger (*Dromicia nana*) from Tasmania, presented by Mast. W. F. Stratford; a Coati, brown variety (*Nasua nasica*) from S. America, presented by Mr. G. P. Crawford; a Lion (*Felis leo*) from Africa, presented by the Hon. M. E. G. Finch Hatton; a Rhesus Monkey (*Macacus erythreus*) from India, presented by Mr. J. C. Freeman; a Tasmanian Rat Kangaroo (*Hypsiprymnus cuniculus*), presented by Mr. J. Shelton; a Garnet's Galago (*Galago garnetti*) from E. Africa, presented by Mr. Bartle Frere; two horned Lizards (*Phryrosoma cornutum*) from Texas, presented by Mr. W. L. Booker; a Clifford's Snake (*Zamenis cliffordii*) from Cairo, presented by Mrs. E. Liveing; a black Stork (*Ciconia nigra*), two white Storks (*C. alba*), and a Spoon-bill (*Platalea leucorodia*), purchased; a red Kangaroo (*Macropus rufus*), and a Fallow Deer (*Dama vulgaris*), born in the Gardens.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 15.—"On the Heating of a Disc by Rapid Rotation *in vacuo*." By Prof. Balfour Stewart, M.A., F.R.S., and Prof. P. G. Tait, M.A.

In two previous communications to this Society, we gave an account of some experiments which we had made upon the heating of a disc through rotation *in vacuo*. In these experiments the increase of radiation of the heated disc was observed by means of a delicate thermopile and galvanometer. Three aluminium discs of various thicknesses and one ebonite disc were used, and the results derived from the experiments were as follows:—

(1) The heating effect observed appeared to be independent of the density, and of the chemical constitution of the residual air and vapour surrounding the discs.

(2) The quantity of heat developed under similar circumstances of rotation in three aluminium discs ·05, ·0375, ·025 of an inch in thickness respectively appeared to be the same, inasmuch as the relative thermometric effect for these discs varied inversely as their thickness.

(3) Besides the heating effect alluded to in (1) and (2), there was found to be, when the vacuum had been recently made, a strictly temporary effect, sometimes in the direction of heat, sometimes in that of cold, owing probably to the condensation or evaporation of small quantities of aqueous vapour; but this effect was only noticeable during rotation, disappearing the moment the motion was stopped.

In June 1871 the experiments were resumed. In the mean time the apparatus had been fitted with an arrangement working through a barometer-tube, by means of which, instead of trusting to radiation, the disc itself might, after rotation, be tapped by means of the pile, which could be brought up to it and then withdrawn. By this means a much larger effect might be obtained, and it became possible, by varying the adjustment, to find according to what law the heat-effect varies with the distance from the centre.

These experiments were conducted in the following manner: The disc was first of all tapped before rotation several times; at each tapping the momentary swing of the needle was recorded, and the mean of the readings was regarded as indicating the state of the disc with respect to heat.

The disc was next tapped after rotation, and the difference between the readings before and after was taken as indicating the change in the state of the disc produced by rotation.

The results derived by tapping an ebonite disc were found to be very different from the radiation-results, inasmuch as in the former the effect of the pressure and quality of the residual air is very apparent, while in the radiation-results it is hardly perceptible. A probable explanation of this will be given afterwards, but in the mean time, in view of these results, it has been thought expedient to discuss them quite independently and by themselves, with the view of ascertaining whether they can best be explained by a gas-effect alone, or whether they likewise indicate a residual effect independent of gas.

With this object calling A B the results at $\frac{9}{20}$ and $\frac{3}{20}$ let us take $\frac{(A)+(B)}{2}$ as representing the *whole effect* at a pressure of $\frac{6}{20}$ in. due to whatever cause or causes. We thus obtain

	Dry hydrogen.	Dry air.	Dry carbonic acid.
Whole effect at $\frac{6}{20}$ . .	9·5	25·0	24·0

Again, let us suppose that (A) – (B) denotes the *gas effect* for $\frac{6}{20}$ in., and we obtain

	Dry hydrogen.	Dry air.	Dry carbonic acid.
Gas-effect at $\frac{6}{20}$ . . .	4·0	20·0	18·0

Finally, let us regard as *unknown residual effect* the difference between the *whole effect* and the *gas-effect*, and we obtain

	Dry hydrogen.	Dry air.	Dry carbonic acid
Residual effect . . .	5·5	5·0	6·0

Similar experiments with the same galvanometer were made with a disc of cartridge-paper, of which the pores were filled with solid paraffin.

Treating these results in the same manner as those of the ebonite disc, we obtain:—

	Dry hydrogen.	Dry air.	Dry carbonic acid.
Whole effect ($\frac{6}{20}$) . .	25·0	45·0	43·5
Gas-effect ($\frac{6}{20}$) . . .	4·0	20·0	23·0
Residual effect . . .	21·0	25·0	20·5

Now, if we suppose that there is only one effect due to gas, it follows:—

(*α*) That the proportion between the effects due to the various gases experimented on (and all of the same pressure) is nevertheless different for the two discs.

(*β*) That the proportion (for the same disc) between the effects due to the various gases experimented on is different according to the pressure.

If, however, we suppose that there are two effects, one of which is independent of the residual gas, we find:—

(*α*) That, as regards the *gas-effect*, the proportion between that due to the various gases is nearly the same for both discs. Thus in the ebonite disc we have 4, 20, 18, while in the paper disc we have 4, 20, 23 as representing the gas-effect for the various gases.

(*β*) That the *residual effect* in either disc is nearly the same for the various gases. Thus in the ebonite disc we have 5·5, 5·0, 6·0, while in the paper disc we have 21·0, 25·0, 20·5 as representing the residual effect for the various gases.

The results are thus much more simple on the hypothesis of two effects, one of these being independent of the residual gas, than on the hypothesis of only one effect.

It was next endeavoured to ascertain whether these two effects were differently influenced by a blind, and it was found that the proportion between the two effects is greatly altered by the blind, so that while the hydrogen effect is not much stopped, the other is diminished very considerably; it was therefore concluded that the residual effect is not much altered by a chamois leather blind.

It was suggested to us by Prof. Helmholtz that it would be desirable to ascertain whether any difference was produced in the results by loading the disc on one side; for if these results be due to vibration, it might be supposed that they would be affected by this means.

It has been seen that the residual effect obtained from a disc covered with chamois leather is approximately the same as that from an uncovered disc; this would appear to us to be against the vibration hypothesis.

In an experiment made the disc was covered with a chamois leather blind with a segment cut out.

From a mean of two sets of experiments we may conclude that this arrangement does not much influence the results.

The disc was next treated in the following manner :—

It was covered with a chamois leather blind tied into holes drilled in the disc, and having two pieces of different shape cut out. The experiments gave (for an atmosphere of $\frac{3}{20}$ dry hydrogen) tapping in A 54, tapping in B 56, while for an uncovered disc they gave 53 as the heat-result. All these experiments apparently combine to prove that the result is not due to vibration.

Our next experiments were made with the view of testing whether or not the two effects, the residual and the gas-effect, were resident in the same particles of the disc ; and for this purpose the experiments made immediately after rotation were compared with those made one minute afterwards.

The experiments available for this purpose are so numerous that they can bear splitting into two portions, in each of which the same result is seen.

Thus we have for an atmosphere of $\frac{3}{20}$ dry hydrogen, and as the mean of 30 individual comparisons.

Effect at first : Effect one minute after : : 1·30 : 1 ;

also, as the mean of 22 individual comparisons, we obtain the proportion of 1·19 : 1, while as the mean of the whole we obtain 1·25 : 1.

Treating in a similar manner the observations made with an atmosphere of $\frac{3}{20}$ hyd. + $\frac{6}{20}$ air, we obtain

As the mean of 25 comparisons .... 1·47 : 1.
As the mean of 21 comparisons .... 1·41 : 1,

while as the mean of the whole we obtain 1·44 : 1.

We therefore conclude that the residual effect is less diminished during the interval of one minute than the gas-effect.

We next made experiments with two aluminium discs ·05 and ·025 of an inch in thickness respectively. These discs were covered on both sides with a coating of lampblack applied by negative photographic varnish.

From these experiments it was concluded that there are two effects which are differently distributed over the particles of the disc.

It also appeared that the effect for $\frac{3}{20}$ hyd. which may be supposed to represent the residual effect, and that for $\frac{3}{20}$ hyd. + $\frac{6}{20}$ air, which may be supposed to represent the gas-effect, are both diminished in very nearly the same proportion, namely 100 : 77, by a transference of the pile to a position nearer the centre of the disc. And it was furthermore concluded from the experiments that in an aluminium disc covered with varnish, as well as in a disc of ebonite, we may imagine the residual effect to be more deeply seated than the gas-effect.

We venture on the following as what appears to us to be the most probable explanation of the whole body of experiments, including those with radiation.

(1) There is a temporary heat or cold effect which may be supposed to arise in particles very slightly attached to the disc ; this is radiated off chiefly during rotation, and does not probably greatly affect the disc afterwards.

(2) There is a surface gas-effect, which in an aluminium and even in an ebonite disc is conducted into the interior as it arises, so that it does not greatly radiate during rotation of the disc. In a paper disc, however, which is formed of a badly conducting material loosely put together, part of the effect does escape as radiation during rotation.

(3) There is a residual effect, which is more deeply seated than the gas-effect. And inasmuch as radiation takes place from a perceptible depth, this effect is much more influential than the gas-effect in increasing radiation after rotation. In the case of a paper disc, this deeply seated effect will be less diminished by radiation during rotation than the gas-effect, and therefore after rotation in such a disc we might expect the gas-effect to be peculiarly small.

In the course of these experiments we have endeavoured to prove that this residual effect is not caused by vibration. The radiation-experiments with aluminium discs of three different thicknesses went, on the other hand, to show that it was of the nature of a surface-effect. This is confirmed by the results derived from tapping ; for, in the first place, the experiments with aluminium discs show that the two effects (the residual and the gas-effect) are probably distributed in the same proportion, going from the centre to the circumference of the disc. Again, taking the two discs of thickness ·05 and ·025 of an inch, we obtain the following results :—

	Effect for $\frac{3}{20}$ hyd.	Effect for $\frac{3}{20}$ hyd. + $\frac{6}{20}$ air.
Thin disc ...	48 (22 observations).	228 (10 observations).
Thick disc...	29 (20 observations).	103 (10 observations).

Now, allowing for errors of experiment, we see that the residual, as well as the gas-effect, is reduced to about one-half for the thick disc.

Again, an experiment of a similar nature gave the effect for $\frac{3}{20}$ hyd. in an ebonite disc of $\frac{1}{10}$ in. in thickness = 33 against a result = 55 for the thin ebonite disc. Unfortunately it was omitted to make a comparison with these two discs for the gas-effect ; nevertheless these results are all in favour of the residual effect being a surface-effect.

Our conclusion from the evidence before us is, that the residual effect is a surface-effect more deeply seated than the gas-effect, but distributed outwards from the centre to the circumference, very much in the same manner as the gas-effect. The residual effect likewise appears able to penetrate a chamois leather blind without any perceptible diminution. We regard these conclusions as preliminary, and shall endeavour in our future experiments to procure additional evidence of these properties of the residual effect, as well as to obtain new facts regarding it. In the meantime, as the subject is one of interest, and has been already too long delayed, we have not hesitated to bring these results before the notice of the Royal Society.

Geological Society, June 11.—Prof. Ramsay, F.R.S., vice-president, in the chair.—The following communications were read :—"On the nature and probable origin of the superficial deposits in the valleys and deserts of Central Persia," by W. T. Blanford. The general results may be summed up as follows :—Persia has undergone a gradual change from a moister to a drier climate simultaneously with the elevation of portions of its surface, resulting first in the conversion of old river-valleys into enclosed basins containing large lakes, probably brackish or salt. Then, as the rainfall diminished, the lakes gradually dried up, leaving desert plains. The amount of subaërial disintegration among the rocks of the high ground he considered to be in excess of the force available for its removal, the water which now falls only sufficing to wash the loosened materials from the steeper slopes into the valleys, and hence the valleys in the upper parts are gradually being filled up with coarse gravel-like detritus, just as their lower portions have been already hidden beneath lake-deposits.—"On *Caryophyllia Bredai* (Milne-Edwards and Haime) from the Red Crag of Woodbridge." by Prof. P. Martin Duncan, F.R.S. The author recorded the occurrence in the Red Crag of the Woodbridge district of a variety of *Caryophyllia Bredai* (Milne-Edwards and Haime).—"On the Cephalopoda-bed and the Ooolite Sands of Dorset and part of Somerset," by James Buckman, F.L.S. From an investigation of the Cephalopoda-bed in quarries at Bradford Abbas in Dorsetshire, the author comes to the conclusion that it is quite distinct from the Cephalopoda-bed of Gloucestershire, and that it is the representative of the Rubbly Oolite at the top of Leckhampton Hill and Cold Comfort, and of the Gryphite and *Trigonia*-beds of the neighbourhood of Cheltenham. The Gloucestershire Cephalopoda-bed he regards as situated close to the bottom of the Inferior Oolite series ; and this is also the position to which he refers the sandy beds above mentioned.—"*Cetarthrosaurus Walkeri* (Seeley), an Ichthyosaurian from the Cambridge Upper Greensand," by H. G. Seeley, F.L.S. In this paper the author described a small Ichthyosaurian femur, discovered by Mr. J. F. Walker in the Upper Greensand of Cambridge. He noticed the general characteristics of the femur in Ichthyosaurians, and pointed out, as the chief peculiarities of the bone that he was describing, the subovate form of its head, and the presence of large flattened lateral trochanters, which, if of equal dimensions on both sides of the bone, would have made its greatest transverse measurement greater than its length. Upon this bone he proposed to found new a genus, *Cetarthrosaurus*.

Royal Astronomical Society, June 13.—Prof. Cayley, F.R.S., president, in the chair.—S. J. Lambert, of Newton Observatory, Auckland, was elected a Fellow of the Society.—The Rev. J. Vale Mummery presented a large photographic portrait of Mrs. Somerville. He said that the Society had long been possessed of a portrait of Miss Caroline Herschel, and he was glad now to be the means of finding her so fitting a companion. Mrs. Somerville and Miss Herschel had been admitted as honorary members of the Society on the same evening in 1834. They had long been separated, first by distance and then by death, and it was only fitting that their portraits should now be hung together on the walls of the Society.—Paper "On a stereographic projection of the transit of Venus in 1882," by R. A. Proctor. The author said that his paper was intended to show the desirableness of limiting the preparations for Halley's method to the transit of 1874. In the transit of 1882 the lines bounding the region where the whole transit can be seen will lie much closer. This is the natural effect of the transit lasting only six hours. Again, the southern pole where difference of duration is greatest, instead of lying within the region where the whole transit can be seen as in 1874, lies outside that region. It should be remembered also that in searching for suitable places of observation a fringe of 10° wide, measuring along the lines where the beginning and end of the transit are seen at sunrise or sunset, must be thrown out of account. Taking this into account the transit of 1882 is seen to be very little suited for Halley's method. Maps were shown to illustrate the paper.—"On occultations of stars by the moon and eclipses of Jupiter's satellites," by the Rev. R. Main. This paper contained a very extensive table of observations of eclipses of Jupiter's satellites. Several such sets of observations have recently been received by the Society, and it was remarked that a paper on the subject read by the Astronomer Royal last year was beginning to bear good fruit.—"Note on the discovery of a new minor planet, No. 131," by Dr. Peters. This is the nineteenth planet discovered by Dr. Peters. Dr. Luther has also discovered 19. Thanks to the American telegraphic system, it has already been observed in England as well as at Leipzig and Marseilles.—"Note on the Mass of Jupiter," by W. T. Lynn. In 1866, he had had the honour of laying before the Society an account of a determination of this element by Prof. Krüger, of Helsingfors. That determination having been recently improved by the aid of subsequent observations, the result was communicated by the author to the *Astronomische Nachrichten* (No. 1,941.) Mr. Syme has, in this "Note," placed it in juxtaposition with the determinations by Airy, Bessel, Jacobs, and Möller. The agreement thus shown is very satisfactory, especially as the methods employed are different—Airy, Bessel, and Jacobs deducing Jupiter's mass from the motions of his satellites, Möller from those of Faye's Comet, and Krügen from those of the planet Kemis. This important element in the solar system may be considered as well established.—"Note on Dr. Oudeman's Photographs of the Solar Eclipse of Dec. 11, 1871," by Col. Tennant. He had received two paper copies of the photographs taken in Java. He could recognise almost every depression of outline as in the Indian photographs, but there was much less detail. He thought we might learn something from them as to photography. It was evident that the light was more intense than in the Indian photographs, but the exposure for a short time had not had the effect of producing the halation which was there visible. He was convinced that in future eclipses it will be better to use a reflector. —Mr. Ranyard remarked that the paper copies of the Dutch photographs which he had seen had been printed from enlargements on glass in which the moon had been stopped out with black paper, or some other material. On measuring, he had found that the body of the moon, as given in the photographs, was by no means circular; and Mr. Davis had pointed out to him that the irradiation under the prominences was perfectly sharp at the edges as it would be when printed through a paper nitch. It was therefore unfair to institute any comparisons as to the amount of the irradiation in these and in the other photographs. —"Note on the sympathetic influence of clocks," by Mr. William Ellis. He had been testing a number of clocks placed upon a wooden frame at the Royal Observatory. At first he found a sympathetic influence, but when the frame was considerably strengthened, so as to prevent vibration, they ceased to influence one another. He concluded that the popular notion as to the vibrations in the air produced by the swing of one pendulum having any susceptible influence on another swinging near to it was erroneous.—"On a recording micrometer," by Mr. W. H. Christie. This contained a description of two rather elaborate instruments for recording the transits of stars by pricks on a long strip of paper. It is intended to make experiments as to the possible use of the instruments at Greenwich.—Proposal to determine the solar parallax by observations of the opposition of the planet Flora. M. Galle invited the assistance of English and Australian astronomers. He had prepared and submitted to the Society a long list of suitable comparison stars.

Linnean Society, June 19.—Mr. Bentham, president, in the chair.—Prof. P. M. Duncan read a paper on the Development of the Gynæcium and method of Fertilisation of the Ovule in *Primula vulgaris*. Prof. Duncan had carefully followed the account given by Duchartre of the mode of development of the ovule in Primulaceæ, from which he differed in many important points, believing that the French observer had been led into error by dissecting only a cultivated and therefore to some extent abnormal variety. In tracing the development of the floral organs Duchartre states that he first of all detected the calyx, then the stamens, and finally the pistil, the placenta being formed in the centre of the cavity of the pistil, and never connected with the ovarian wall. With this statement Payen agrees. Dr. Duncan's observations agreed with these as far as the formation of the calyx and stamens was concerned; but within the latter he found simply a mamillary process. At the next stage there was a very short style, solid and not perforated, the ovarian wall including the placenta on which were the rudimentary ovules; the ovarian wall does not grow up over the placenta, but is produced from it by a kind of differentiation; subsequently the style lengthens and the small stigma is produced. The ovules appear in a spiral series, and are recognised by their power of reflecting light; the summit of the placenta has never any connection with the style. The ovule consists of nothing but a single integument and an embryo-sac: there is no inner integument and no nucleus. The lower portion of the tissue of the style is absolutely impervious to the pollen-tubes; and if these could enter the ovary in this way, the micropyles are in such intimate contact with the placenta, that they could never be reached by the tubes from the cavity of the ovary. Dr. Duncan has detected the passage of the pollen-tubes actually through the tissue of the placenta itself, from which they again emerge to reach the micropyle of the ovule. In the discussion which followed, this view of the course of the pollen-tubes was confirmed by Dr. T. S. Cobbold.—Dr. Hooker read a paper by the Rev. C. New, on the sub-alpine vegetation of Kilma-njaro. This is the only tropical African alpine flora with which we are acquainted; the mountain being situated in Eastern Africa, 3° S. lat., rising to a height of 20,000 ft., or nearly 5,000 ft. above the snow-level. The flora is essentially that of the Cameroons. The flora may be divided into seven regions of successive heights; the 1st is the inhabited district, with plantains, maize, &c.; the 2nd region is jungle; the 3rd is a forest of gigantic trees covered with moss, the herbaceous vegetation being essentially European, with the dock and stinging-nettle, frosts almost every night; the 4th consists of green hills covered with clover; the 5th is heath; the 6th bare hills; the 7th, everlasting snow. Of the fifty species contained in the collection, twenty were from the zone immediately beneath the perpetual snow; nearly all were of South African genera, very few European, and no new species not already known from the Cameroons. The flora is therefore essentially South African.

Meteorological Society, June 18.—Dr. J. W. Tripe, president, in the chair.—The following papers were read:—On some results of temperature observations at Durham, by John J. Plummer.—On the Meteorology of New Zealand, 1872, by C. R. Marten.—On the Climate of Vancouver Island, by Robert H. Scott, F.R.S.—Meteorological Observations at Zi-Ka-Wei, near Shanghai, by Rev. A. M. Colombel, with note by Rev. S. J. Perry, F.R.A.S.—Notes on the connection between Colliery Explosions and Weather, by R. H. Scott, F.R.S., and William Galloway.—Distribution of Rainfall Maxima in Great Britain and Ireland between the years 1848 and 1872 inclusive, by W. R. Birt, F.R.A.S., and note on the heavy Rainfall of March 4 at Natal, by R. J. Mann, M.D., F.R.A.S. The ordinary meeting was then adjourned and the Annual General Meeting was held, and the Report of the Council read. The Report stated that the Council had much pleasure in congratulating the Society, at the close of the twenty-third session, upon the termination of a year which will bear favourable comparison with any that precedes it, whether regard be had to the character of the papers read, to the attendance at the periodic meetings, to the number of new Fellows elected, or to the activity and interest evinced in the general proceedings. It was stated that it had been found necessary to hold an extra meeting in May to enable all the papers which had been received to be presented before the Society; and the Council had the gratification to announce that it is in contemplation to hold eight monthly meetings next session, instead of six as has been the practice hitherto. The number of new Fellows added to the Society during the year had amounted to 35, the accession thus indicated being considerably larger than upon any years since 1864. Reference was made to the library, the financial affairs, the proposed alterations of the bye-laws, and the recent meteorological conference at Leipzig; and the Council concluded by stating that they had had under consideration that evening a letter from the Board of Trade with reference to sending a representative to the Meteorological Congress to be held at Vienna in September next. The President then delivered an Address in which he chiefly referred to the progress of the Society during the two years that he had occupied the presidential chair. The following gentlemen were elected officers and council for the ensuing year:—President—Dr. Robert James Mann, F.R.A.S. Vice-presidents—Arthur Brewin, F.R.A.S., George Dines, Henry Storks Eaton, Lieut.-Col. Alexander Strange, F.R.S. Treasurer—Henry Perigal, F.R.A.S. Trustees—Sir Antonio Brady, F.G.S., Stephen William Silver, F.R.G.S. Secretaries—George James Symons, John W. Tripe, M.D. Foreign Secretary—Robert H. Scott, F.R.S. Council—Charles Brooke, F.R.S., Charles O. F. Cator, Rogers Field, C.E., Frederic Gaster, James Glaisher, F.R.S., John Knox Laughton, F.R.A.S., William Carpenter Nash, Thomas Sopwith, F.R.S., Rev. Fenwick W. Stow, M.A., Capt. Henry Toynbee, F.R.A.S., Charles Vincent Walker, F.R.S., E. O. Wildman Whitehouse, C.E.

BERLIN

German Chemical Society, June 9.—A. W. Hofmann, president, in the chair. A. Behr and Van Dorp report oxide of lead heated in iron tubes to be a good oxidising agent for organic vapours: $C_6H_4(CH_2)_2$ yielding $C_8H_4(CH)_2$, &c.—E. Salkowsky has found that taurine escapes digestion in the human body to a large extent. A small quantity of the following compound, however, passes into the urine; a crystallised acid of the empirical formula, $C_3H_8N_2SO_4$, forming quadratic plates, which are easily soluble, and giving well-crystallised salts with Ba, Ag, &c. With baryta water it yields taurine, carbonic acid and ammonia. The acid appears to be a substitution product of our hydrogen in taurine through carbaminic acid. Dr. Salkowsky took 5 grammes of taurine for twelve days following without suffering any great inconvenience to his health.—T. Thomsen sent in the results of very numerous experiments on the heat absorbed or developed by dissolving various salts in water. The same *savant* attacks the calorimetric method employed by Berthelot, and disputes his conclusions as to the existence of a hydrate $HCl + 8H_2O$.—K. Heumann has found that copper in contact with sulfide of ammonium becomes covered with crystals of subsulfide Cu_2S, according to the reaction $2CuO + 2(NH_4)_2S = Cu_2S + 4NH_3 + 2H_2O + S$.—H. v. Gegenfeld reports on the action of hypochlorous acid HClO on allylic chloride. The dichlorhydrine thus formed he considers as isomeric with that prepared from glycerine, while L. Henry obtained a body through the same reaction, which he considers as identical with ordinary dichlorhydrine.—L. Bisschopinck has studied the amides and the nitrites of the three chloracetic acids, particularly with regard to their physical properties. The most prominent result is the following irregularity in the boiling points of the nitriles, namely:—

$CH_3.CN$ boils at 81—82°
$CH_2Cl.CN$ „ 123—124°
$CHCl_2.CN$ „ 113—113°
$CCl_3.CN$ „ 83—84°

The foregoing remarks were accompanied by a note of M. L. Henry on the boiling-points of the cyanides of negative radicals. He points out that if in HCN, H is replaced by a negative element or radical, the boiling point sinks; thus HCN 26°, Cl.CN 15°, CN.CN —21°, adding other examples, and the attempt of an explanation of this exceptional phenomenon. The same chemist has continued his researches on propargylic alcohol C_3H_3OH. He has found its boiling point equal to 114°, and he has prepared the bromide, the iodide, the sulfocyanide, and the acetate belonging to it. In treating brominated allylic alcohol $C_3H_4Br.OH$ with potash, he obtains besides propargylic alcohol an ether $(C_3H_4Br)_2O$, and perhaps also propargylic ether, which has not as yet been obtained in the pure state.

PARIS

Academy of Sciences, June 16.—M. de Quatrefages, president, in the chair. The following papers were read:—On the combustion heat of formic acid, by M. Berthelot.—On the alloys used for gold coinage, by M. Eug. Pelegot. The author advocated the addition of zinc to the alloy, and at the same time the reduction of the gold to a very great amount. He mentions with favour alloys containing from 48 to 66 mill. zinc, 354 to 372 copper, and 580 to 581 gold.—A report on the papers on *Phylloxera*, by MM. Duclaux, Max. Cornu, and L. Faucon was presented.—On the complete movements of a ship oscillating in calm water, by MM. O. Duhil, de Benazé and P. Risbec. The authors gave an account of their experiments on the *Elorn*, a vessel of 100 tons displacement.—Photo-chemical researches on the use of gases as developers, and on the influence of physical conditions as regards sensitisation, by M. Merget, was a paper on some of the chemical phenomena of photography.—On a scientific balloon ascent on the 26th April, 1873, by MM. Crocé-Spinelli, Jobert, Pénaud, Petard, and Sivel.—Announcement of the discovery of Planet 132 at Washington on the 14th June, by Prof. Henry.—Researches on electricity produced by mechanical actions, &c., by M. L. Joulin. Researches on essence of alan-gilan (*Unona odoratissima*), by M. H. Gal. The author has discovered benzoic acid in this essence, and believes that this is the first instance of this body being found in an essence, it having hitherto been found only in the balsams.—Contributions to the history of the histologic constitution of Molitg's glarin, by M. A. Bechamp. This paper related to the gelatinous body found in the sulphurous springs of the Pyrenees. The author finds that microscopic examination shows it to be a mass of microzymes imprisoned in a hyalin matrix. He has tried various experiments on its action as a ferment.—On the estimation of the total nitrogen in manures, by M. H. Pellet.—On the estimation of phosphoric acid in natural phosphates, super-phosphates, and manures, by M. H. Joulie.—On a process for the estimation of hæmoglobin in blood, by M. Quinquaud.—On the determination of the mechanical equivalent of food, by M. A. Sanson. The author pointed out the immense value to all employers of animal motive power, such as military authorities, &c., of the value of a method for ascertaining the value in work of the forage they use for their horses. He estimated the value of 1 kilo. of protein in a good average ration, as, in round numbers, 1,600,000 metre-kilograms.—Experimental researches on the influence of barometric changes on the phenomena of life, 11th note, by M. P. Bert.

DIARY

THURSDAY, JUNE 26.

SOCIETY OF ANTIQUARIES, at 8.30.

FRIDAY, JUNE 27.

QUEKETT CLUB, at 8.

SATURDAY, JUNE 28.

GEOLOGISTS' ASSOCIATION.—Excursion to Hatfield.

TUESDAY, JULY 1.

SOCIETY OF BIBLICAL ARCHÆOLOGY, at 8.30.—The Fall of Nineveh and the First Year of Nebuchadnezzar, King of Babylon: J. W. Bosanquet.

WEDNESDAY, JULY 2.

HORTICULTURAL SOCIETY.—Rose Show.

BOOKS RECEIVED

ENGLISH.—Field Pocket Book for the Auxiliary Forces: Colonel Sir Garnett Wolseley (Macmillan and Co.).—Education of Man (Charles Griffin & Co.)—Light Science for Leisure Hours. 2nd Series: R. A. Proctor (Longmans & Co.).—The Old Faith and the New: Dr. F. Strauss (Asher & Co.)—The Scholar's Arithmetic: Lewis Hensley (C. P. S. Macmillan & Co.).

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